

# **On The Exact Recovery Of Higher-Order Moments Of Noisy Signals**

Cheded, L.;Dept. of Syst. Eng., King Fahd Univ. of Pet.Miner., Dhahran;  
**Digital Signal Processing Workshop Proceedings, 1996., IEEE;Publication Date: 1-4  
Sep 1996;ISBN: 0-7803-3629-1**  
King Fahd University of Petroleum & Minerals

**<http://www.kfupm.edu.sa>**

## **Summary**

The importance of moments in science and engineering, as witnessed by the continuous and wide applicability of second-order moments (correlations) and the use of their higher-order brethren is clearly unquestionable. Due to the predominance of digital, rather than analogue, signal processing, it is of practical importance to investigate the impact of amplitude quantization on the exact recovery of unquantized moments from their quantized counterparts. We extend the results of Cheded (see IEEE ICASSP'95, p.1816-19, Detroit, USA) to the more general and interesting case where no a priori knowledge of the quantizer input's membership of the class  $L_p$  is available. We introduce a new moment-sense input/output function  $h_p(x)$  that statistically characterizes the quantizer. Two new theorems are also stated that solve the exact moment recovery problem. Finally, two approaches to this problem are presented with some simulation results: based on a 1-bit quantizer, that substantiate very well the theory

For pre-prints please write to: [abstracts@kfupm.edu.sa](mailto:abstracts@kfupm.edu.sa)